Journal of Applied Mechanics and Technical Physics 2010 vol.50 N6, pages 927-935

Determining the shape of an axisymmetric body in a viscous incompressible flow on the basis of the pressure distribution on the body surface

Solov'ev S.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

A method is developed for determining the shape of an axisymmetric body on the basis of the pressure coefficient distribution specified along the meridional section of the body. Viscosity is taken into account within the framework of the boundary layer model. The method is based on an iterative process, which involves the solutions of the inverse problem in the plane case and of the direct problem for an axisymmetric body. A code implementing the iterative process is written, and examples of numerical results are given. © 2009 Springer Science+Business Media, Inc.

http://dx.doi.org/10.1007/s10808-009-0126-7

Keywords

Axisymmetric body, Boundary layer, Inverse boundary-value problem of aerohydrodynamics, Iterative process, Panel method, Viscous incompressible fluid